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**MS APPEAL BRIEF - PATENTS**

Docket No.: 0641-0255P

(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Walter BERRYMAN

Application No.: 10/694,888

Confirmation No.: 4113

Filed: October 29, 2003

Art Unit: 1762

For: CIRCUITS INCLUDING A TITANIUM  
SUBSTRATE

Examiner: B. K. Talbot

**CORRECTED APPEAL BRIEF TRANSMITTAL FORM**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Transmitted herewith is an Appeal Brief on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on September 17, 2007.

☒ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27.

The fee has been calculated as shown below:

☐ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - \$-.

☐ Fee for filing an Appeal Brief - \$250.00 (small entity).

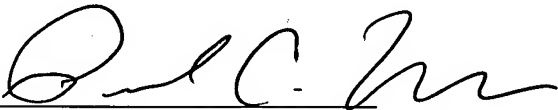
☐ Check(s) in the amount of \$- is(are) attached.

☐ Please charge Deposit Account No. 02-2448 in the amount of \$-. A triplicate copy of this sheet is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: September 18, 2007

Respectfully submitted,

By 

Paul C. Lewis

Registration No.: 43,368

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant

Attachment(s)



Docket No.: 0641-0255P  
(PATENT)

Box AF

APPEAL BRIEF

EXPEDITED PROCEDURES EXAMINING  
GROUP 1762

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Walter H. Berryman

Application No.: 10/694,888

Confirmation No.: 4133

Filed: October 29, 2003

Art Unit: 1762

For: CIRCUIT INCLUDING A TITANIUM  
SUBSTRATE

Examiner: Brian K. Talbot

**CORRECTED APPEAL BRIEF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Appellant hereby appeals from the decision in the final Office Action dated September 25, 2006 finally rejecting claims 1-4, 6, 7 and 9-12.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF CORRECTED APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205:

- I. Real Party In Interest
- II. Related Appeals and Interferences
- III. Status of Claims
- IV. Status of Amendments
- V. Summary of Claimed Subject Matter
- VI. Grounds of Rejection to be Reviewed on Appeal
- VII. Argument
- VIII. Claims
- IX. Evidence

X. Related Proceedings  
Appendix A – Claims  
Appendix B – Evidence (Previously Filed)  
Appendix C – Related Proceedings (None)

**I. REAL PARTY IN INTEREST**

The real party in interest for this application is HYBRID ELECTRONICS AUSTRALIA PTY LTD, by an assignment recorded at Reel 015157, Frame 0803.

**II. RELATED APPEALS AND INTERFERENCES**

To the best of Appellant's knowledge, there are no other prior or pending appeals of this application, or patent interference proceedings, or judicial proceedings which may be related to, directly affect, or be directly affected by, or have a bearing on the Board's decision of this Appeal.

**III. STATUS OF CLAIMS**

In the application on appeal, claims 1-4, 6, 7 and 9-12 are pending. Claim 1 is independent. Claims 1-4, 6, 7 and 9-12 are rejected and are on appeal. During the prosecution, claims 5, 8 and 13-24 were canceled.

**IV. STATUS OF AMENDMENTS**

Examiner Talbot indicated to Mr. Robert J. Webster, Reg. No., 46,472, one of Appellant's representatives, in a telephone conversation on May 22, 2007, that the previously filed Amendment under 37 CFR 1.116 will be entered for purposes of appeal. This statement is a record of that conversation. Also, the Notice of Non-Compliant Appeal Brief, dated September

6, 2007, states that the Amendment under 37 CFR §1.116 was not only entered, but that it overcame the rejection of claims 9 and 11, under 35 USC §112, Second Paragraph.

**V. SUMMARY OF THE CLAIMED SUBJECT MATTER**

Claim 1 is the sole independent claim.

Claim 1 positively recites a process for manufacturing a thick-film circuit having at least one element on a titanium or titanium alloy substrate to substantially prevent formation of a bent substrate comprising the steps of (1) applying a glassy dielectric layer (disclosed, for example, in the paragraph bridging pages 5 and 6 of the specification, from page 5, line 31 to page 6, line 9, the dielectric layer being illustrated, for example, in drawing Figs. 1 and 2) upon at least one surface of said substrate (the substrate being discussed in the same aforementioned paragraph and being illustrated in drawing Figs. 1 and 2), the composition and layer thickness of which are selected according to its temperature coefficients and Young's modulus to substantially prevent bending of the substrate after it has cooled to ambient temperature (discussed in detail, for example, in the third full paragraph on page 9, i.e., in lines 17-27 of page 9, the paragraph bridging pages 9 and 10, i.e., from page 9, line 29 to page 10, line 11, and in Table 1, located between lines 11 and 15 on page 10 of the specification); (2) firing said glassy dielectric layer in an oxidizing atmosphere (disclosed, for example, in original claim 6, and in the second full paragraph on page 7, i.e., in lines 16-27 of page 7, which discloses the formation of an oxide layer during firing, and is shown, for example, in Fig. 2); and (3) forming at least one element of said thick-film circuit upon said dielectric layer (disclosed, for example, in the paragraph bridging pages 6 and 7, i.e., from page 6, line 31 to page 7, line 6); wherein the composition and layer thickness of the at least one element is selected according to its temperature coefficient and Young's modulus to substantially prevent bending of the substrate after it has cooled to ambient temperature (this feature is disclosed, for example, in the third full paragraph on page 9, i.e., in lines 17-27 of page 9, and in the paragraph bridging pages 9 and 10, i.e., from page 9, line 29 to page 10, line 11, and in Table 1 on page 10 of the specification).

Claim 3, while being a dependent claim, does not stand or fall with claim 1, i.e., is patentably distinct from claim 1. In addition to the features recited in claim 1, support for which (in Appellant's disclosure) is set forth in detail above, claim 3 positively recites that the glassy layer includes lead content, the method further including diffusing the lead through titanium oxides on the, or each, surface of the substrate to form a relatively strong bond between the substrate and the dielectric layer immediately adjacent to it. Support in Appellant's disclosure for this positively recited method step of claim 3 is found, for example, starting on page 5, line 32 and continuing to page 6, line 18.

**VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

A. Claims 1, 2, 4 and 9-12 stand rejected under 35 USC §103(a) as being unpatentable over DE 383598 A1 (Zimmermann).

C. Claim 3 stands rejected under 35 USC §103(a) as being unpatentable over Zimmermann in combination with U.S. Patent 6,551,720 to Sreeram et al.

D. Claims 6 and 8 stand rejected under 35 USC §103(a) as being unpatentable over Zimmermann in combination with U.S. Patent 2,959,503 to Lindson.

**VII. ARGUMENT**

A. Claims 1, 2, 4 and 9-12 stand rejected under 35 USC §103(a) as being unpatentable over DE 383598 A1 ("Zimmermann").

Appellant respectfully submits that this rejection is improper and should be reversed for the following reasons.

During patent examination the PTO bears the initial burden of presenting a *prima facie*

case of unpatentability. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444(Fed. Cir. 1992); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788(Fed. Cir. 1984). This burden can be satisfied when the PTO presents evidence, by means of some teaching, suggestion or inference either in the applied prior art or generally available knowledge, that would have appeared to have suggested the claimed subject matter to a person of ordinary skill in the art or would have motivated a person of ordinary skill in the art to combine the applied references in the proposed manner to arrive at the claimed invention. See Carella v. Starlight Archery Pro Line Co., 804 F.2d 135, 140, 231 USPQ 644, 647 (Fed. Cir. 1986); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); In re Rinehart, 531 F.2d 1048, 1051-1052, 189 USPQ 143, 147 (CCPA 1976).

If the PTO fails to meet this burden, then the Appellant is entitled to the patent. However, when a *prima facie* case is made, the burden shifts to the Appellant to come forward with evidence and/or argument supporting patentability. Patentability *vel non* is then determined on the entirety of the record, by a preponderance of evidence and weight of argument, *Id.*

Because the rejection is based on 35 U.S.C. §103, what is in issue in such a rejection is "the invention as a whole", not just a few features of the claimed invention. Under 35 U.S.C. §103, "[a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." The determination under section 103 is whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. See In re O'Farrell, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). In determining obviousness, the Examiner must explain what the differences between the claimed invention and the prior art are and provide objective factual evidence to support a conclusion that it would be obvious to one of ordinary skill in the art to achieve the claimed invention, which includes those missing features.

In the second place, in rejecting claims under 35 U.S.C. §103, it is incumbent on the examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one of ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. *Uniroyal Inc. v. F-Wiley Corp.*, 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988), *cert. denied*, 488 U.S. 825 (1988); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), *cert. denied*, 475 U.S. 1017 (1986); *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a *prima facie* case of obviousness. *Note In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be suggested or taught by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1970). All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

A showing of a suggestion, teaching, or motivation to combine the prior art references is an “essential evidentiary component of an obviousness holding.” *C.R. Bard, Inc. v. M3 Sys. Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not “evidence.” *See In re Dembiczak*, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999).



Moreover, a factual inquiry whether to modify a reference must be based on objective evidence of record, not merely conclusory statements of the Office, e.g., either an Examiner or a Board. See In re Lee, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002), and Brand v. Miller 2006-1419 (Fed. Cir. May 14, 2007).

Claim 1 positively recites a combination of features that is neither disclosed in, nor suggested by, Zimmermann. For example, claim 1, as amended, recites a combination of features including applying a glassy dielectric layer upon at least one surface of said substrate, the composition and layer thickness of which are selected according to its temperature coefficients and Young's modulus to substantially prevent bending of the substrate after it has cooled to ambient temperature; firing said glassy dielectric layer in an oxidizing atmosphere; and forming at least one element of said thick-film circuit upon said dielectric layer; wherein the composition and layer thickness of the at least one element is selected according to its temperature coefficient and Young's modulus to substantially prevent bending of the substrate after it has cooled to ambient temperature. Zimmermann does not explicitly disclose these positively recited features, nor does it disclose them inherently, i.e., necessarily, as required by case law. Inherency may not be established by probabilities or possibilities. In re Oelrich, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981) and In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). What is alleged to be inherent must necessarily occur. The mere fact that something *may* result from a given set of circumstances is not sufficient. In re Oelrich, 212 USPQ 323, 326 (CCPA 1991). "Inherent" disclosure requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art." Trintec Indus., Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 1295, 63 USPQ2d 1597, 1599 (Fed. Cir. 2002) (quoting In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

The Office Action admits that Zimmermann does not disclose the claimed invention but indicates that it does choose processing parameters to achieve the desired result, which is all that is necessary to meet the claimed limitations. The Office Action contends that Zimmermann chooses processing parameters to achieve the desired result being a final product that does not

suffer from distortion/bending or warping, which the Examiner says is all that is necessary to meet the limitations recited in the claims. The rejection is premised on the speculation that the drawings in Zimmermann allegedly show a final product that does not suffer from distortion/bending or warping.

Appellant respectfully disagrees with this statement. The claimed invention positively recites a combination of features which are not even contemplated by DE 3838598 A1, and are not disclosed, either explicitly or inherently (necessarily). Further, the Office Action never provides any objective factual evidence that (1) one of ordinary skill in the art would be properly motivated to modify Zimmermann to arrive at the claimed invention, without any disclosure of the claimed process steps, or (2) how one would go about substantially preventing bending of the substrate after it has cooled to ambient temperature, as claimed.

This rejection is based primarily on unwarranted speculation as to what Zimmermann discloses and, as such, is improper. It is well settled that a rejection under 35 U.S.C. §103 cannot properly be based on speculation but must be based on objective factual evidence of record. See, In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968). See, also, In re GPAC, Inc., 35 USPQ2d 1116 at 1123 (Fed. Cir. 1995) and Ex parte Haymond, 41 USPQ2d 1217 at 1220 (Bd. Pat. App. & Int. 1996).

Moreover the statement that that the drawings in Zimmermann allegedly show a final product that does not suffer from distortion/bending or warping is somewhat contradicted by the admission in the final Office Action that the specification of Zimmermann does not recite or even suggest this phenomenon as occurring.

Appellant also respectfully submits that the Office Action fails to make out a *prima facie* case of inherent disclosure in Zimmermann for the following additional reasons.

Firstly, a claim limitation is inherent in the prior art if it is necessarily present in the prior art, not merely probably or possibly present. Rosco v. Mirro Lite, 304 F.3d 1373, 1380, 64 USPQ2d 1676 (Fed. Cir. 2002). The dispositive question regarding anticipation is whether one

skilled in the art would reasonably understand or infer from the prior reference's teaching that every claim feature or limitation was disclosed in that single reference, Dayco Products, Inc. v. Total Containment, Inc., 329 F.3d 1358, 1368, 66 USPQ2d 1801 (Fed. Cir. 2003).

Moreover, the Appellant has examined the drawings provided by Zimmermann but does not agree with the Examiner that they necessarily depict a final product that does not suffer from distortion/bending or warping. Figures 1 and 2 of Zimmermann are close up sectional views that are drawn on a highly magnified scale, at which scale bending and/or warping would not be evident. To illustrate this point Appellant prepared samples of a substrate that has undergone warping or bending. The samples, marked specimens A, B, C and D, were filed as a single attachment to this Amendment in a plastic bag with a sealing strip and with a label indicating the Application No., the Attorney's Docket Number, filing date, this law firm's name and address, and a legend indicating that the contents are Specimens A, B, C and D, as recommended in MPEP §608.03(a), entitled, "Handling of Models, Exhibits and Specimens." Specimen A comprises a titanium blank substrate (3 up size), specimen B comprises a titanium completed substrate with one glass (sacrificial) layer on the back, seven separately fired glass layers on the front, two separately fired conductor layers on the front and many resistor, thermistor and strain element ink prints with one firing process on the front. Specimens C and D comprise titanium bent substrates that are only partially coated. After four separately fired front glass layers the bending is too great to allow further printing. For each of the additional 6 firing processes to follow there would be additional bending as the root cause of the bending is the oxide layer on the back (and its different expansion coefficient from the titanium) rather than any different expansion coefficients between the glass layers and the titanium. Examination of the specimens reveals a maximum deflection or bending of the metal substrate of less than ¼ inch over the full length of the substrate. Applicant had previously indicated in the response to the final rejection that examination of the specimens reveals a maximum deflection or bending of the metal substrate of approximately ¼ inch over the full length of the substrate, but informed Applicant's below-named representative on May 23, 2007 that the extent of bending in the specimens appears to be less than ¼ inch. Applicant respectfully submits that this fact in no way detracts

from the force of Applicant's argument but, on the contrary, makes the bending gradient in specimens C and D smaller, thereby making it even more difficult to detect bending or warping through a narrow slit that is at most 0.3mm wide (as discussed, below). As the substrate is approximately 3 inches long, this translates to a maximum bending gradient of less than 1 in 6. Figures 1 and 2 of the drawings in cited DE 3838598 depict a cross-sectional view of a thick film electronic circuit on a metal substrate 1. The dimensions of the circuit are not indicated in the document. However, having regard to circuits of this kind the horizontal dimension of the drawings in Figures 1 and 2 is unlikely to exceed 0.3mm. The scale of the drawings in Zimmermann is such that the degree of bending or warping is unlikely to be evident.

This may be seen by examining the two specimens C and D on a scale similar to Zimmermann. This is equivalent to viewing the specimens through a narrow slit that is at most 0.3mm wide. Even if such a narrow slit was placed over the specimens at a point of maximum bending gradient, the bending or warping (clearly evident in specimens C and D) would not be visible in such a narrow view. Thus substrate bending that is sufficient to prevent further printing could not be seen on the drawings shown. In any event the drawings in Zimmermann appear to be quite stylized or idealized as is common with diagrammatic cross-sections of integrated circuits and similar products in order to make the layer structure more clear. In this regard it should also be kept in mind that the principal purpose of the drawings in Zimmermann is to show the relationship between a metallic substrate (1) and the various layers that are applied to the substrate in the disclosed process for manufacturing a thick-film electronic circuit. The fact that the drawings in Zimmermann do not show bending can be interpreted in one of two ways. Either Zimmermann did not consider bending to be an issue and has not addressed this problem, or alternatively, Zimmermann solved the bending problem but did not consider disclosing it in his text. In either event there appears to be little evidence that Zimmermann has "achieved" the desired result, being a final product that does not suffer from distortion/bending or warping. Appellant notes that the Advisory Action acknowledges receipt of these samples, and review of them, referring to them as "artifact."

Thus, the Office Action fails to make out a *prima facie* case of obviousness of claims 1,

2, 4 and 9-12 by Zimmermann.

Reconsideration and reversal of this rejection of claims 1, 2, 4 and 9-12 are respectfully requested.

B. Claim 3 stands rejected under 35 USC §103(a) as unpatentable over DE 3838598 A1 (“Zimmermann”) in view of U.S. patent 6,551,720 to Sreeram et al. (“Sreeram”). This rejection is respectfully traversed.

Claim 3 recites a combination of features including wherein the glassy layer includes lead content and the step of diffusing lead content in the glassy layer through titanium oxides to enhance sufficiency of the bond between the substrate and the adjacent dielectric layer.

Zimmermann does not disclose this combination of features, nor does Sreeram which provides a separate lead glaze between a glassy-dielectric layer which can include lead, to provide good locking of the titanium metal substrate to the glass-ceramic composition.

The Office Action asserts that lead diffusing into the titanium glaze would take place inherently and asks the Appellant to provide evidence to rebut this position.

Unfortunately, this is putting the cart before the horse. As explained by the case law cited above, the burden is on the Office to make out a *prima facie* case of inherent disclosure and may not be shifted to Appellant.

No *prima facie* inherency case has been made out by the office because there is no indication in DE 3838598 A1 that its green tape includes lead. Nor does the Office Action even address the issue of motivation to modify DE 3838598 A1 in view of Sreeram. Nor has the Office Action provided objective factual evidence that one of ordinary skill in the art would turn to Sreeram to modify DE 3838598 A1 to include lead which is what is recited. Sreeram does not teach modifying the green tape composition to include lead. Instead, Sreeram uses a

separate lead glaze between the green tape and the titanium metal substrate, which is not what is claimed.

So, even if one of ordinary skill in the art were motivated to modify DE 3838598 A1 in view of Sreerer, the resulting modification would neither meet nor render obvious the claimed invention.

In response to this previously presented argument, the Office Action states that Sreeram provides motivation “as the lead glaze reduces oxidation of the titanium and allows good mechanical locking of the titanium to the glass ceramic composition in the firing process (col. 11, lines 20-35).”

Unfortunately, this rebuttal argument fails to address the fundamental shortcoming of the rejection, i.e., the continued failure of the Office to provide objective factual evidence that diffusing of lead into the titanium substrate not just possibly takes place, and not just probably takes place, but necessarily takes place, as is the standard required to make out a *prima facie* case of inherent disclosure.

Appellant also notes that a further difference between Zimmermann and the present invention is the feature wherein the present invention applies a glassy dielectric layer upon a surface of the titanium or titanium-alloy substrate and then fires in an oxidizing atmosphere the glassy dielectric layer that is in contact with the substrate. Zimmermann does not do this. Zimmermann fires in an inert atmosphere the insulating layer that is in contact with the metal substrate. Zimmermann fires a second insulating layer in an oxidizing atmosphere (room air) but that second layer is not in contact with the titanium substrate. The significance of this difference is the present invention aims to promote oxidation of the upper surface of the substrate to some extent by firing in an oxidizing atmosphere in order to promote a strong bond (with lead diffusion). In contrast Zimmermann inhibits such oxidizing of the upper surface of the substrate by firing the first layer in an inert atmosphere. This difference underscores the speculative nature of the Examiner’s assertion that lead diffusion is inherently disclosed (i.e., necessarily occurs) in Zimmerman.

Thus, the Office Action fails to make out a *prima facie* case of obviousness of claim 3.

Reconsideration and reversal of this rejection are respectfully requested.

C. Claims 6-8 stand rejected under 35 USC §103(a) as unpatentable over DE 3838598 A1 (“Zimmermann”) in view of U.S. Patent 2,959,503 to Lindson.

Initially, Appellant respectfully submits that DE 3838598 A1 neither discloses nor suggests the invention recited in claims 6-8 at least because of the shortcomings of DE 3838598 A1 discussed above.

Moreover, Lindson is not applied to remedy the discussed shortcomings of DE 3838598 A1, so even if one of ordinary skill in the art were properly motivated to modify DE 3838598 A1, as suggested, that modification would neither meet nor render obvious the claimed invention.

Furthermore, as noted above, a showing of a suggestion, teaching, or motivation to combine the prior art references is an “essential evidentiary component of an obviousness holding.” C.R. Bard, Inc. v. M3 Sys. Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232(Fed. Cir. 1998). This showing must be clear and particular, and broad conclusory statements about the teaching of multiple references, standing alone, are not “evidence.” See In re Dembiczak, 175 F.3d 994 at 1000, 50 USPQ2d 1614 at 1617 (Fed. Cir. 1999). Appellant respectfully submits that this broad conclusory teaching of Lindson about coating titanium with a glass coating to prevent oxidation is not clear and particular enough to provide it on a reverse side of the substrate.

Thus, the Office Action fails to make out a *prima facie* case of obviousness of claims 6-8.

Reconsideration and reversal of this rejection are respectfully requested.

## **VIII. CLAIMS**

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

## **IX. EVIDENCE (Previously Filed)**

Evidence was submitted in the form of samples, marked specimens A, B, C and D, as a single attachment to the Amendment filed on March 23, 2007 in a plastic bag with a sealing strip and with a label indicating the Application No., the Attorney's docket Number, filing date, and this law firm's name and address, and a legend indicating that the contents are Specimens A, B, C and D, as recommended in MPEP §608(a). Specimen A comprises a titanium blank substrate (3 up size), specimen B comprises a titanium completed substrate with one glass (sacrificial) layer on the back, seven separately fired glass layers on the front, two separately fired conductor layers on the front and many resistor, thermistor and strain element ink prints with one firing process on the front. Specimens C and D comprise titanium bent substrates that are only partially coated.

Appellant no longer has these specimens, because they were filed, and are located, in the USPTO. They have been entered in the record, as noted in paragraph No. 10 of the Advisory Action, dated April 13, 2007.

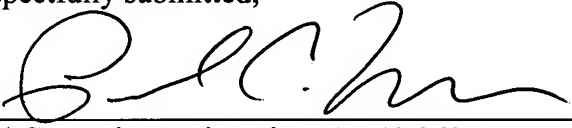


**X. RELATED PROCEEDINGS**

No related proceedings are referenced in II above, or copies of decisions in related proceedings are not provided, hence no Appendix is included.

Dated: September 18, 2007

Respectfully submitted,

By   
Paul C. Lewis, Registration No. 43,368  
BIRCH, STEWART, KOLASCH & BIRCH, LLP  
P.O. Box 747  
Falls Church, Virginia 22040-0747  
(703) 205-8000  
Attorney for Appellant



**APPENDIX A - CLAIMS ON APPEAL**

1. (Previously Presented) A process for manufacturing a thick-film circuit having at least one element on a titanium or titanium-alloy substrate to substantially prevent formation of a bent substrate comprising the steps of:

applying a glassy dielectric layer upon at least one surface of said substrate, the composition and layer thickness of which are selected according to its temperature coefficients and Young's modulus to substantially prevent bending of the substrate after it has cooled to ambient temperature; and

firing said glassy dielectric layer in an oxidizing atmosphere; and

forming at least one element of said thick-film circuit upon said dielectric layer; wherein the composition and layer thickness of the at least one element is selected according to its temperature coefficient and Young's modulus to substantially prevent bending of the substrate after it has cooled to ambient temperature.

2. (Previously Presented) The process as claimed in claim 1 wherein said thick-film circuit includes a hybrid circuit.

3. (Previously Presented) The process, as claimed in claim 1 wherein said glassy layer includes lead content, said method further including the step of diffusing the lead through titanium oxides on the or each surface of said substrate to form a relatively strong bond between said substrate and the dielectric layer immediately adjacent to it.

4. (Previously Presented) The process as claimed in claim 1 further including the step of firing additional layers of similar or different dielectric material on top of the dielectric layer immediately adjacent said substrate.

5. (Canceled)

6. (Previously Presented) The process as claimed in claim 1 further including the step of placing a layer of dielectric material on a reverse side of said substrate to inhibit growth of oxide during said firing.

7. (Previously Presented) The process as claimed in claim 6, further including the step of removing the dielectric layer placed on the reverse side after at least some of the firing is complete.

8. (Canceled)

9. (Previously Presented) The process, as claimed in claim 1 further including the step of modifying temperatures of firing of a plurality of layers to control bending of said thick-film circuit.

10. (Previously Presented) The process, as claimed in claim 4 further including the

step of arranging dielectric layers upon which the at least one element of said circuit is printed on said substrate, including layers that are printed on top of the at least one element, to control temperature coefficient of resistivity of the at least one element.

11. (Previously Presented) The process as claimed in claim 10 wherein the at least one element is selected from the group consisting of a resistor, thermistor and a strain gauge.

12. (Previously Presented) The process, as claimed in claim 1 wherein said thick-film circuit includes a strain gauge, said method further including the steps of providing a plurality of different dielectric inks, adjusting relative concentration of said dielectric inks, and mixing the inks together before firing same to produce a layer or layers upon which said strain-gauge is printed and fired to control temperature coefficient of resistivity of said strain gauge.

13-24. (Canceled)

**APPENDIX B - EVIDENCE**

Appellant filed samples, marked specimens A, B, C and D, as a single attachment to the Amendment filed on March 23, 2007 in a plastic bag with a sealing strip and with a label indicating the Application No., the Attorney's docket Number, filing date, and this law firm's name and address, and a legend indicating that the contents are Specimens A, B, C and D, as recommended in MPEP §608(a). Specimen A comprises a titanium blank substrate (3 up size), specimen B comprises a titanium completed substrate with one glass (sacrificial) layer on the back, seven separately fired glass layers on the front, two separately fired conductor layers on the front and many resistor, thermistor and strain element ink prints with one firing process on the front. Specimens C and D comprise titanium bent substrates that are only partially coated.

Appellant no longer has these specimens, because they were filed, and are located, in the USPTO. They have been entered in the record, as noted in paragraph No. 10 of the Advisory Action, dated April 13, 2007.

**APPENDIX C - RELATED PROCEEDINGS**

(None)